

# Particle swarm algorithms for multi-local optimization\*

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## Abstract

Traditional particle swarm optimization (PSO) algorithms proved to be valid in finding a global optimum. In this paper we propose a modification to the PSO algorithm by introducing the gradient information or an approximate descent direction to enable the computation of all the global and local optima of a single multi-modal objective function. The numerical experiments carried out with a set of well-known test problems show the effectiveness of the proposed algorithm.

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